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**US AIR FORCE
INSTALLATION RESTORATION PROGRAM**

**DECISION DOCUMENT
LF06-LANDFILL 3 AND HARDFILL AREA**

SHEPPARD AFB, TEXAS

TX 3571524161



**HEADQUARTERS AIR TRAINING COMMAND
RANDOLPH AFB, TEXAS**

FEBRUARY 1990

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AIR FORCE INSTALLATION RESTORATION PROGRAM

DECISION DOCUMENT LF06 - LANDFILL 3 AND HARDFILL SHEPPARD AIR FORCE BASE, TEXAS

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**SUBMITTED BY
HAZARDOUS WASTE REMEDIAL ACTIONS PROGRAM
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POST OFFICE BOX 2003
OAK RIDGE, TENNESSEE 37831-7606
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TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
EXECUTIVE SUMMARY	1
1.0 INTRODUCTION	1
1.1 PROGRAM BACKGROUND	2
1.2 SITE DESCRIPTION	4
2.0 REMEDIAL INVESTIGATION FINDINGS	4
3.0 REMEDIAL ACTION ALTERNATIVES	10
4.0 CONCLUSIONS	10

FIGURES

<u>NUMBER</u>	<u>PAGE</u>
1 AREA LOCATION MAP, LANDFILL NUMBER 3 (LF06)	3
2 SITE PLAN, LANDFILL NUMBER 3 (LF06)	5
3 WATER-TABLE CONTOUR MAP ON JANUARY 17, 1989, LANDFILL NUMBER 3 (LF06)	6

TABLES

<u>NUMBER</u>	<u>PAGE</u>
1 SITE 4 - LANDFILL NUMBER 3 (LF06) SURFACE SOIL, SUBSURFACE SOIL, AND SEDIMENT ANALYTICAL DATA	8
2 SITE 4 - LANDFILL NUMBER 3 (LF06) GROUND-WATER AND SURFACE-WATER ANALYTICAL DATA	10

EXECUTIVE SUMMARY

As part of the Installation Restoration Program (IRP), Air Training Command (ATC) and Sheppard Air Force Base (AFB) requested a site investigation at Landfill 3 and Hardfill Area (LF06) to determine the presence or absence of contamination and the risk to public health and the environment, if any, associated with past operations at this site.

This document was prepared to review the available data, to evaluate alternative actions, and to fulfill the requirements and objectives of the National Environmental Policy Act.

LF06, comprising about 60 acres at the northwest corner of the base, was operated from about 1957 until 1972 as a landfill for normal base refuse and construction rubble. During the remedial investigation (RI), surface-soil, subsurface-soil, ground-water, and surface-water samples were collected and analyzed for Target Compound List volatile organics, base neutral/acid extractables, polychlorinated biphenyls, and priority pollutant metals. In addition, water samples were analyzed for common anions, and total dissolved solids.

Levels of organic contamination identified were below Contract Required Detection Limits established by the U.S. Environmental Protection Agency Contract Laboratory Program. Levels for the detected metals are attributable to background levels for the Texas region, except for selenium reported in two ground-water samples. Additional investigation was not required since use of ground water from the shallow surficial aquifer in the vicinity of Sheppard AFB is very limited, the background levels for selenium in soils are 100 to 500 $\mu\text{g/l}$, the selenium concentration gradient flowing off site is below the Safe Drinking Water Act maximum contaminant level, and there are no known receptors.

It is recommended that LF06 be removed from further IRP consideration.

1.0 INTRODUCTION

The purposes of this decision document are to describe the history of LF06 at Sheppard AFB, evaluate sample data collected and analyzed, review site alternatives, and present conclusions and decisions on the disposition of the site. Figure 1 shows

the general location of Sheppard AFB. Evaluations were based on conditions as described in the following:

- Engineering-Science, Installation Restoration Program Phase I--Records Search, Sheppard AFB, Texas, February 1984.
- Radian Corporation, Installation Restoration Program, Phase II--Confirmation/Quantification, Stage I--Final Report, Volumes I and II, April 1987.
- NUS Corporation, Draft Remedial Investigation Report, Sheppard AFB, Texas, February 1990.

1.1 PROGRAM BACKGROUND

In response to the Resource Conservation and Recovery Act (RCRA) of 1976 and in anticipation of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the U.S. Air Force (USAF) implemented the Defense Environmental Quality Program Policy Memorandum (DEQPPM) 80-6, dated June 1980 (rev. DEQPPM 81-5, December 1981). The Installation Restoration Program (IRP) at USAF installations and facilities was concurrently implemented. The IRP is a multi-phased investigative and remedial effort designed to identify and evaluate past material disposal or spill sites and to control potential migration of environmental contamination. The magnitude of contamination is to be quantified by analysis of appropriate soil, sediment, water, and air samples. Data from these analyses are used to assess potential human health and environmental risks. The IRP was originally developed and implemented as follows:

- Phase I - Records Search and Hazard Assessment Rating Methodology Site Ranking
- Phase II - Confirmation and Quantification Studies (staged efforts)
- Phase III - Technology Development
- Phase IV - Remedial Action

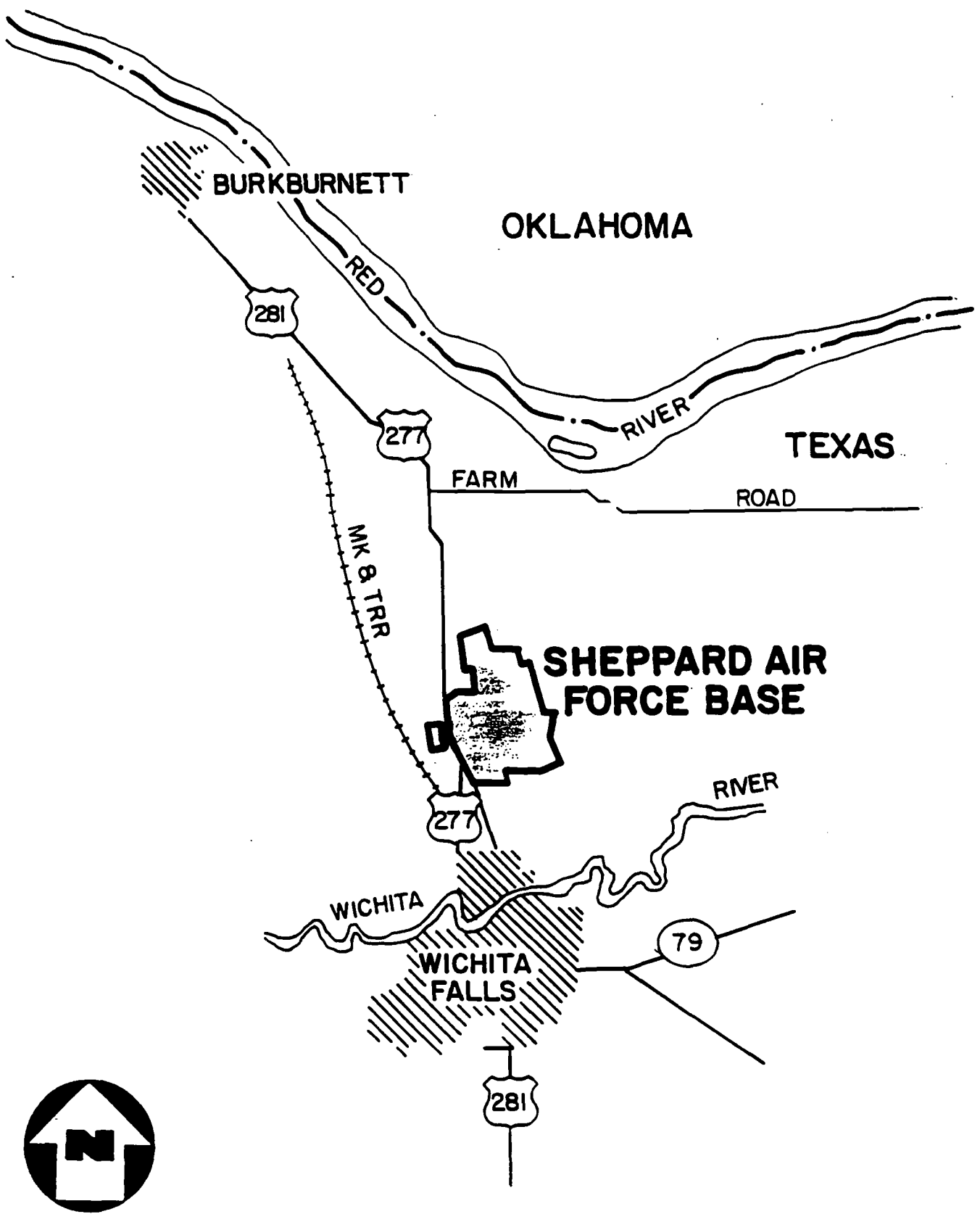


FIGURE 1
AREA LOCATION MAP
LANDFILL NO.3 (LF06)
SHEPPARD AIR FORCE BASE

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This four-phased approach to the IRP has been changed to ensure consistency between the IRP and other national hazardous waste cleanup programs. The terminology and procedures for the IRP have been changed to match those given in the National Contingency Plan as follows:

- PA/SI - Preliminary Assessment/Site Inspection
- RI/FS - Remedial Investigation/Feasibility Study
- RD/RA - Remedial Design/Remedial Action

1.2 SITE DESCRIPTION

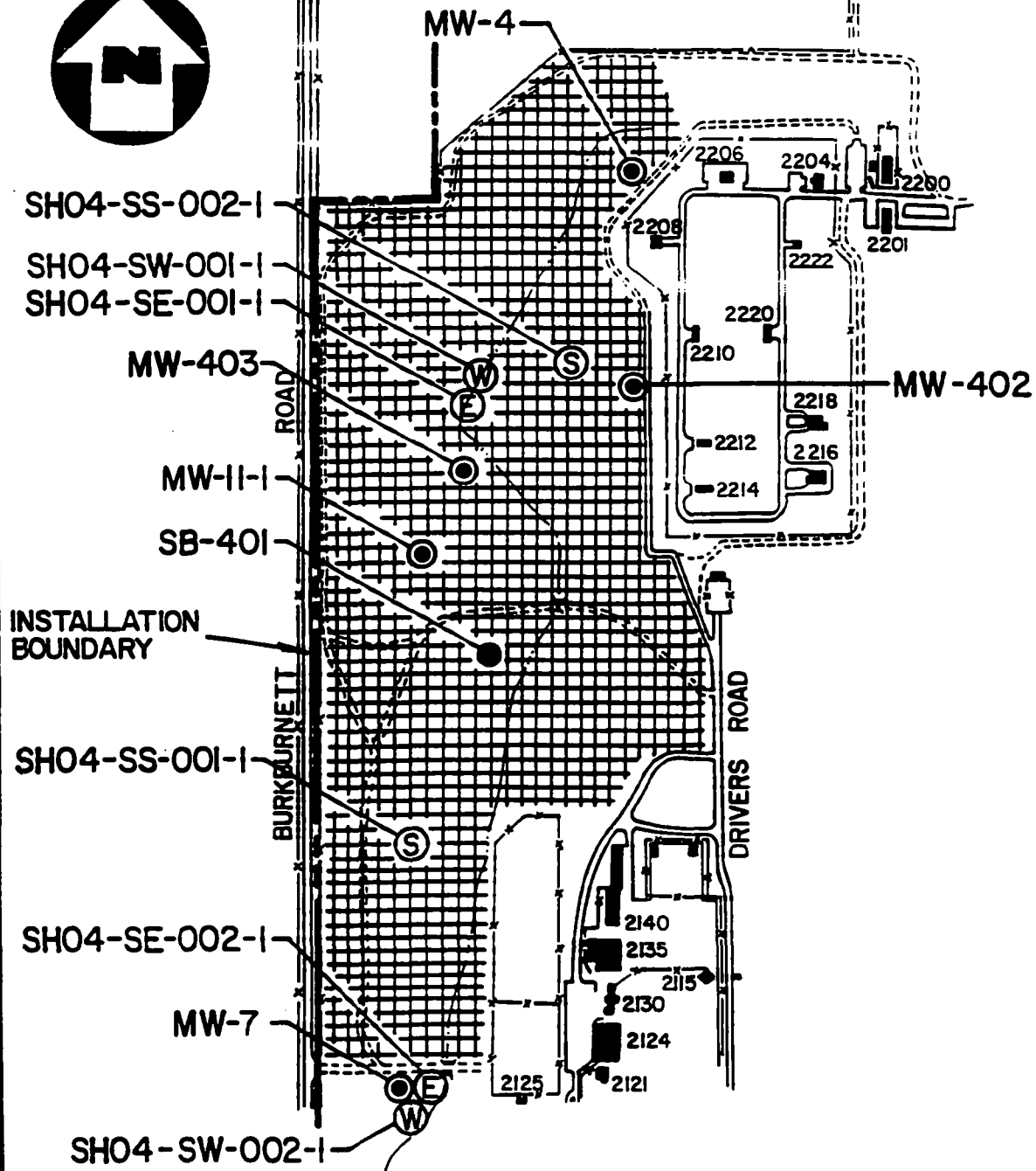
LF06 comprises approximately 60 acres along the northwest side of the Base, with its western edge generally parallel to the installation boundary. The landfill area is located between Burkburnett Road and Drivers Road. An unnamed creek runs through the site and eventually empties into Bear Creek (Figure 2).

LF06 was in operation from about 1957 to 1972. The material disposed of in this landfill was primarily normal base refuse (i.e., trash, garbage), waste water treatment sludge, waste oil, construction rubble, and incinerator ash. The operation was performed as trench-and-fill with east-west trenches approximately 14 feet deep. Burning of the refuse occurred until 1968, after which burning ceased. From about 1965 to 1970, trenches in the northern area of the landfill received waste oils and refuse. Volume estimates range from one to seven 55-gallon drums of waste oil per week. Settling has occurred in the former trenches and formed surface depressions. These depressions often collect rainfall.

2.0 REMEDIAL INVESTIGATION FINDINGS

Soils in the landfill area are disturbed due to landfill operations but adjacent areas have silty loam type soils. Due to excavation and fill activities, the permeabilities in the area could be highly variable; however, a subsurface base of clay was confirmed by well borings. Ground water is usually present at about 10 feet below ground surface, and generally flows north as illustrated on Figure 3. A total of three soil borings, SB-401 through SB-403, were drilled around the periphery of observed trenches at LF06. Three subsurface soil samples were collected from each boring for

GRAPHIC SCALE
0 400' 800' 1600'



LEGEND

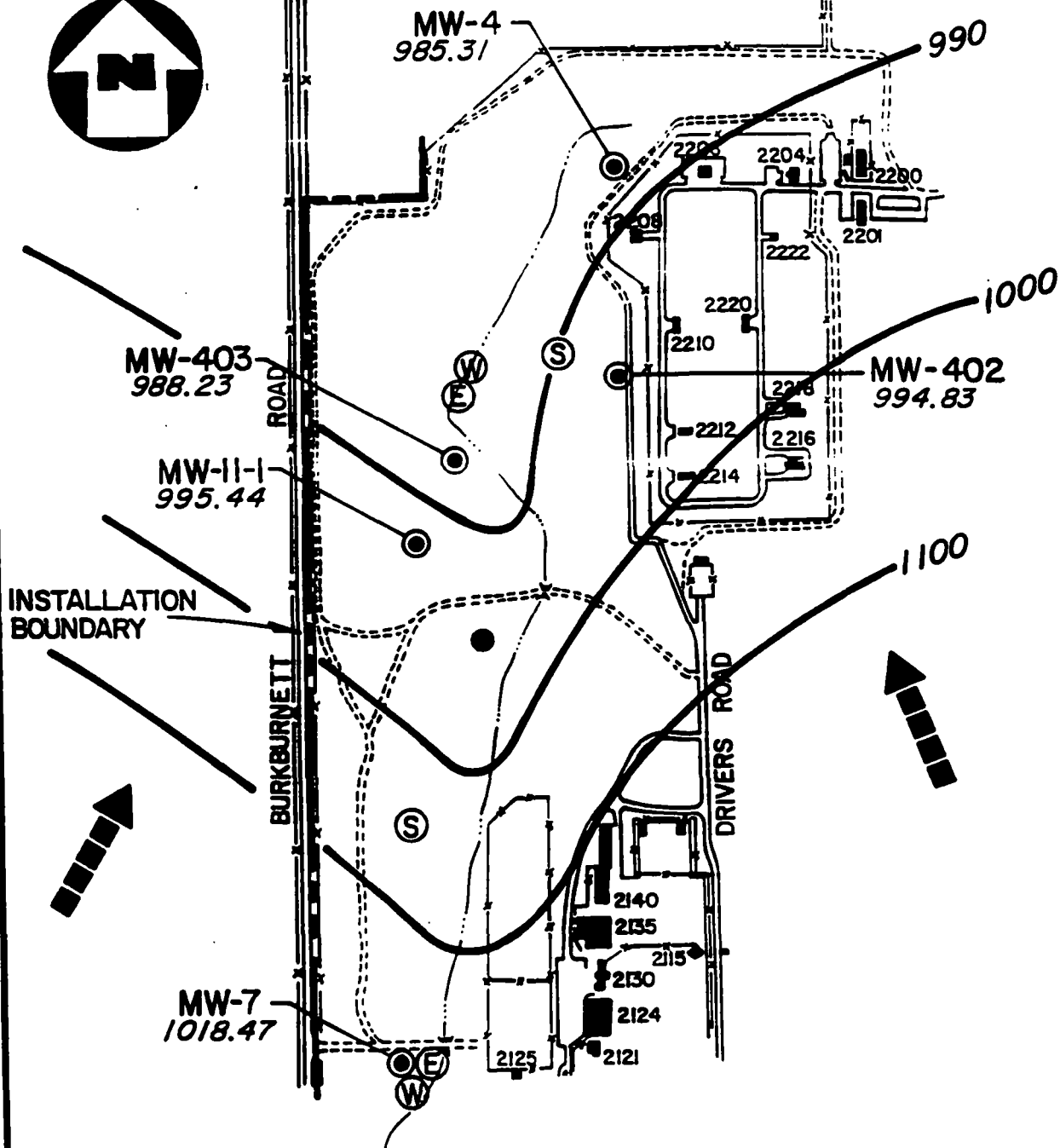
- MONITORING WELL
- SOIL BORING
- SURFACE SOIL SAMPLE
- SURFACE SEDIMENT SAMPLE
- SURFACE WATER SAMPLE



FIGURE 2
SITE PLAN
LANDFILL NO.3 (LF06)
SHEPPARD AIR FORCE BASE



GRAPHIC SCALE
0 400' 800' 1600'



LEGEND

- MONITORING WELL
- WATER TABLE ELEVATION' 122.90
- WATER TABLE CONTOUR' (DASHED WHERE APPROX.)
- GROUND WATER FLOW DIRECTION
- ' - ELEVATION IN FEET ABOVE MEAN SEA LEVEL

FIGURE 3
WATER TABLE CONTOUR MAP
ON JANUARY 17, 1989
LANDFILL NO.3 (LF06)
SHEPPARD AIR FORCE BASE



laboratory analyses in order to determine if any leachate or associated contaminants had migrated away from the landfill. Borings SB-402 and SB-403 were completed as monitoring wells MW-402 and MW-403. These two wells, MW-4 and MW-7, provided ground-water samples as part of the remedial investigation. Figure 2 depicts the locations for the borings, monitoring wells, and additional surface soil, sediment, and surface water samples obtained to further characterize the site.

Based on previous sample analysis and waste disposal history of this site (general refuse, waste water treatment sludge, waste oil, solvents, construction rubble, and incinerator ash), all samples, including soil and water, were analyzed for Target Compound List volatile organics, priority pollutant metals, base neutral/acid extractables, and polychlorinated biphenyls. Also, one surface-soil and one subsurface-soil sample were analyzed for cation exchange capacity, while surface-water and ground-water samples were analyzed for pH, common anions, cyanide, and total dissolved solids.

No organic contamination was identified in ground water or surface water above Contract Laboratory Detection Limits as established by the USEPA Contract Laboratory Program. These established limits are reliable, reproduceable and reflect levels that meet the applicable or relevant and appropriate requirements. Levels for the metals, arsenic, beryllium, chromium, copper, cadmium, lead, nickel, and zinc, reported for the soil and subsurface soil, are within expected background levels for the Texas region, as set forth in USGS Professional Paper Number 1270, Element Concentrations in Soils and Other Surficial Materials of the Conterminous United States. Table 1 indicates the positive detection of contaminants in LF06 soils.

Selenium reported for the ground-water samples from MW-7 (17 $\mu\text{g/l}$) and MW-402 (13.5 $\mu\text{g/l}$) exceeded the Safe Drinking Water Act maximum contaminant level (10 $\mu\text{g/l}$). However, analysis of ground water at MW-403 and MW-4 either did not detect this metal or it was found to be below the MCL. Use of ground-water from the shallow surficial aquifer in the vicinity of Sheppard AFB is very limited due to the abundance of clay and silt and the discontinuous nature of the interbedded sand layers making the aquifer an unreliable source for water supply. There were no

TABLE 1
SITE 4 - LANDFILL NUMBER 3 (LF06)
SURFACE SOIL, SUBSURFACE SOIL, AND SEDIMENT ANALYTICAL DATA
SHEPPARD AIR FORCE BASE, TEXAS

Sample Number	Date Sampled	Sample Depth (feet)	Arsenic (mg/kg)	Beryllium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Nickel (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)	Di-N-Octylphthalate (ug/kg)	Cation Exchange Capacity
SUBSURFACE SOIL														
SH04-SU-MW401-A	11/12/88	6	2.63	1.1	1.0E	31	--	6.7E	--	30	--	66	--	--
SH04-SU-MW401-B	11/12/88	13	--	1.9	--	37	--	1.52E	32	--	--	--	--	--
SH04-SU-MW401-C	11/12/88	23	2.75	1.1	1.0E	31	9.8E	5.72E	36	--	8.3	--	--	--
SH04-SU-MW402-A	11/12/88	6	4.2	1.5	--	35	--	13.7E	27	--	--	--	--	--
SH04-SU-MW402-B	11/12/88	11	2.59	1.7	--	46	--	7.0E	31	54	--	--	--	--
SH04-SU-MW402-C	11/12/88	19	5.8	1.1	--	30	--	14.8E	30	51	--	--	--	--
SH04-SU-MW403-A	12/12/88	6	1.9	1.4	--	42.9E	12	8.3	--	39E	--	40.6	--	38.6
SH04-SU-MW403-B	12/12/88	12	0.8	2.2	47.6E	--	7.2	6.3	0.2	42.3E	10.9	48.8	--	27.6
SH04-SU-MW403-C	12/12/88	17	3	1.4	1.1	31.1	9.2	5.4	0.2	31.9E	--	42.1	--	29.0
SURFACE SOIL														
SH04-SS-001-1	12/08/88		2.4	1.2	--	12.7	5.5	16.6E	0.4	12.6	--	25.4E	--	--
SH04-SS-002-1	12/08/88		3.9	1.7	--	17.9	5.9	13.8E	0.2	19.5	--	29.8E	60	--
SEDIMENT														
SH04-SE-001-1	12/08/88		6.7	2.2	--	25.5	21.4	29.9E	0.5	34.1	--	62.1	--	--
SH04-SE-002-1	12/08/88		6.4	2.1	--	27.5	19.3	--	0.5	32.5	--	59.2E	--	--

Notes: E = estimated value.

(--) - analytical results below Contract Required Detection Limits (CRDLs).

TABLE 2

**GROUND-WATER AND SURFACE-WATER ANALYTICAL DATA
SITE 4 - LANDFILL NUMBER 3 (LF06)
SHEPPARD AIR FORCE BASE, TEXAS**

Sample Number	Date Sampled	Arsenic (ug/kg)	Bromine (mg/kg)	Chloride (mg/l)	Cyanide (mg/l)	Fluoride (mg/l)	Lead (ug/l)	Nitrate (mg/l)	Selenium (ug/l)	Sulfate (mg/l)	Total Dissolved Solids (mg/l)	Total Petroleum Hydrocarbons (mg/l)
GROUND WATER												
SH04-GW-MW004-A	11/19/88	--	15.8	3,151.0	--	--	2E	9.7	7	954.0	--	241.0
SH04-GW-MW007-A	11/19/88	7	14.1	3,149.0	--	--	--	1.3	17.0	1,594.0	1,123	279.8
SH04-GW-MW402-A	12/18/88	--	17.7	3,650	--	5.2	--	4.7	13.5	1,069	10,268	--
SH04-GW-MW403-A	12/18/88	--	23.1	2,529	6.63E	6.9	--	3.7	--	1,608	14,408	--

Sample Number	Date Sampled	Antimony (ug/l)	Bromine (mg/kg)	Butylbenzyl-phthalate (ug/l)	Chloride (mg/l)	Fluoride (mg/l)	Nitrate (mg/l)	Sulfate (mg/l)	Total Dissolved Solids (mg/l)	Total Petroleum Hydrocarbons (mg/l)
SURFACE WATER										
SH04-SW001-1	12/08/88	--	2.9	--	78.1	1.1	--	49.2	437	34.8
SH04-SW002-1	12/08/88	55.5E	0.91	6	160.0	1.4	0.81	72.8	632	57.6

Note: (--) = analytical results below Contract Required Detection Limits (CRDLs).

E = estimated.

known receptors (no one pumping water from this aquifer for any purpose) identified during the remedial investigation. The selenium detected in the ground water could be leaching from the soils where the normal background levels referenced for selenium are 100 to 500 ug/l. Tracing the concentration gradient of selenium levels from the upgradient wells MW-7 and MW-402 through wells MW-403 and MW-4, it is apparent that any off-site concentration levels are below the Safe Drinking Water Act maximum contaminatn level. Based on these findings, it is unnecessary to further evaluate this contaminant. Table 2 presents the analytical results of the ground-water and surface-water sampling and analysis.

3.0 ALTERNATIVES FOR DISPOSITION

As previously shown, IRP Phase I, Phase II, and a Remedial Investigation have been conducted at LF06 at Sheppard AFB. The results from these investigations have shown no contamination that poses a risk to the public or the environment. Because the elements found do not pose a risk to the public or the environment, alternatives to reduce or eliminate those risks or to lower concentration levels will not be examined. No further action is required at this site.

4.0 CONCLUSIONS

Past disposal activities conducted at LF06 led to this investigation because of concerns of possible soil and water contamination. Analytical results from soil and water samples obtained during this investigation indicate that past disposal activities have not introduced contamination into the environment and that contamination in the future is unlikely. Because of this, no potential health-based risks need to be examined and no additional remedial investigation measures are necessary. Therefore, based on the available data, and the consideration of the effect of this site on the quality of human health and the environment, it is recommended that this site be removed from further IRP consideration.

Concur/Non-Concur

SIGNED

Signature: _____

Date: 28 FEB 1990

RUSSELL J. POWERS, Colonel, USAF
Asst DCS/Engineering & Services